School Shop

vol. XII no. 7

MARCH 1953

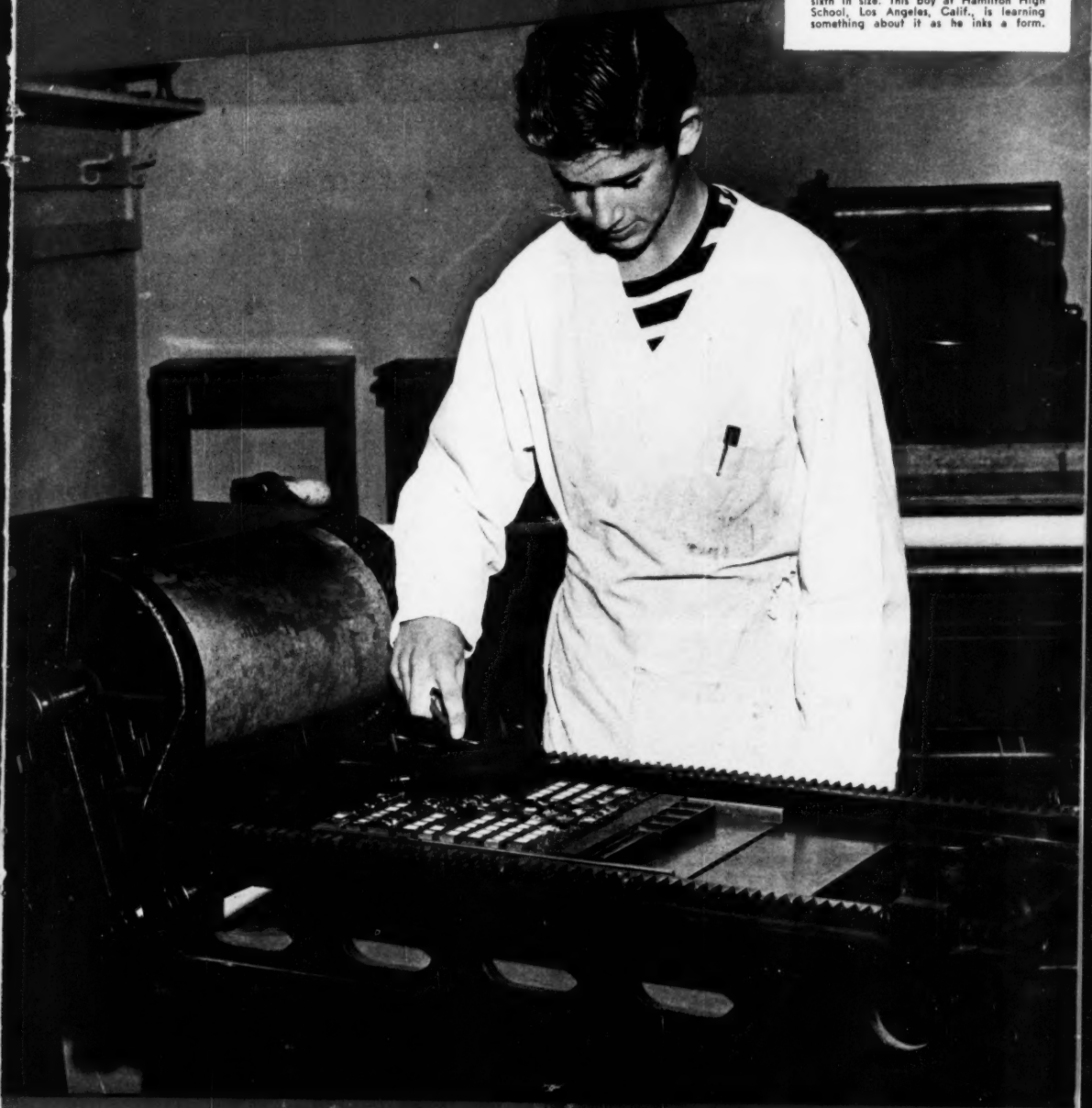
Industrial Arts and Culture
by F. Theodore Paige

Photo Enlarger
by John Emmel

Theory—An Important Part of the Electric Shop
by Morris Tischler

Plastics in Industrial Arts
by Delmar W. Olson

Cover story: The graphic-arts industry ranks sixth in size. This boy at Hamilton High School, Los Angeles, Calif., is learning something about it as he inks a form.



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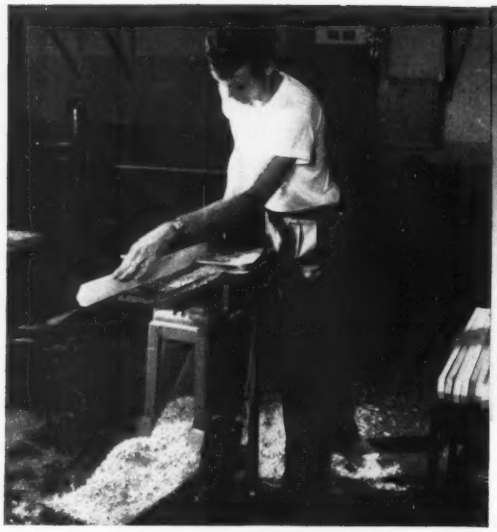

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School Shop TALK

COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

A Guest Editorial

Mankind's Progress Through the Practical Arts

Since the beginning of time, mankind's progress has been closely allied to his technical progress. Nations whose technical strides outdistanced their neighbors became the leaders of the world in their day. Less scrupulous nations used this advantage to become the rulers of the more backward states until stagnation and decay overtook them, and they succumbed to others whose technological advances outdistanced theirs.

Nations that have fostered education, encouraged research, and provided opportunities for individuals to better their economic outlook, as long as they did not transgress on the rights of others, have always emerged as the leaders.

The vital ingredient in the success formula seems to be free education. It has made possible a way of life for the American people that is envied throughout the world. Education today, as distinct from the training and education in an earlier day, differs chiefly in that we are concerned with the development of the whole child into a well-rounded personality, and not merely with the acquisition of either manipulative skills or cyclopedic knowledge.

General education assumes the responsibility for preparing boys and girls to become democratically-minded, clear-thinking, healthy individuals, equipped with the necessary knowledges and skills to obtain for themselves the things they desire and need for a wholesome life.

Just as early guild training could not do the whole job of producing well-balanced individuals, so formal education and subject matter have also fallen short of this goal.

In the light of this past experience, today's educational program attempts to achieve these desired goals by giving each student basic experience in skills and basic training in understanding our cultural heritage, in democratic procedures and health habits that will develop desirable understandings and attitudes. It attempts to teach through concepts, not through the mere memorization of academic subject matter, but by actually employing these skills and understandings in solving real or simulated problems under the guidance of capable teachers.

Those in industrial arts have long advocated this method of learning, believing that the more lifelike the situation in which the learning takes place, the more permanent will be the results.

In the past ten years we have witnessed a phenomenal growth and development of new sources of power, transportation, and communication. We have been ushered into the atomic age, where we have witnessed some of the tremendous destructive power of the atom, and have begun to learn of its staggering industrial possibilities.

Radar and turbo-jet engines have increased the safety of air travel and at undreamed-of speeds. With each new development pushing back the limits of speed, time, and space to the borders of what was regarded yesterday as infinity, and each new development changing the living habits of the world, it behooves us to reexamine the training of our young, if we are to fit them into their world of tomorrow.

What type of instruction and subject matter will be of greatest use in future living? With the increasing rate of change, it would be folly to try to predict which subjects would be of the most value. Because of this uncertainty of needs for highly developed specific skill training, today's thinking stresses basic skills, understandings, and appreciations that can serve as a good groundwork for all trades and professions. We hope, thereby, to produce a more versatile citizen, capable of readily adapting himself to his ever-changing surroundings and conditions.

We know that each new development has come only from a thorough understanding of the basic principles. If we can then teach these basic concepts and fundamental principles through a practical approach, we need have no fear of the future.—*Industrial Arts Department, Milwaukee, Wisconsin, Public Schools, Roy Radtke, Supervisor.*

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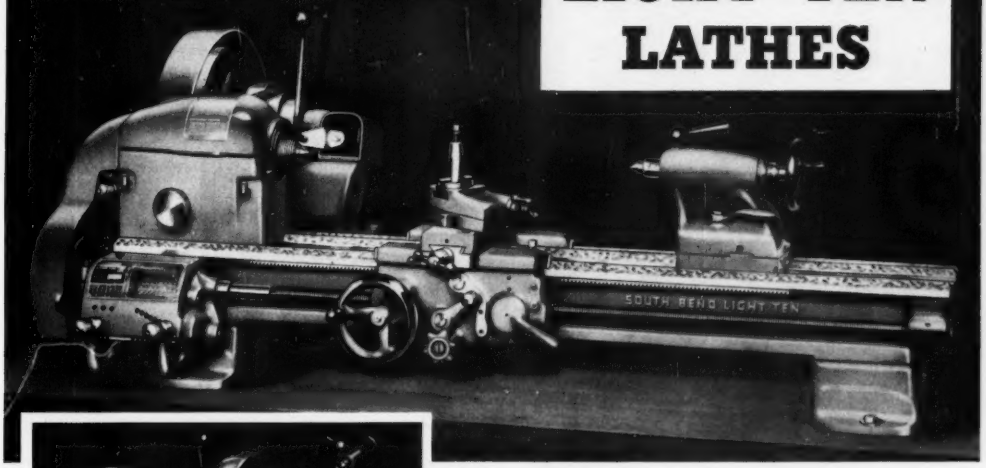

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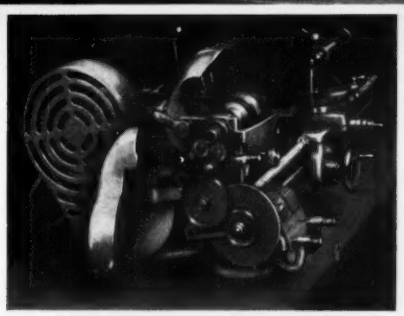

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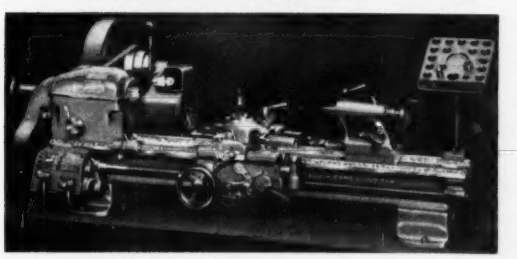

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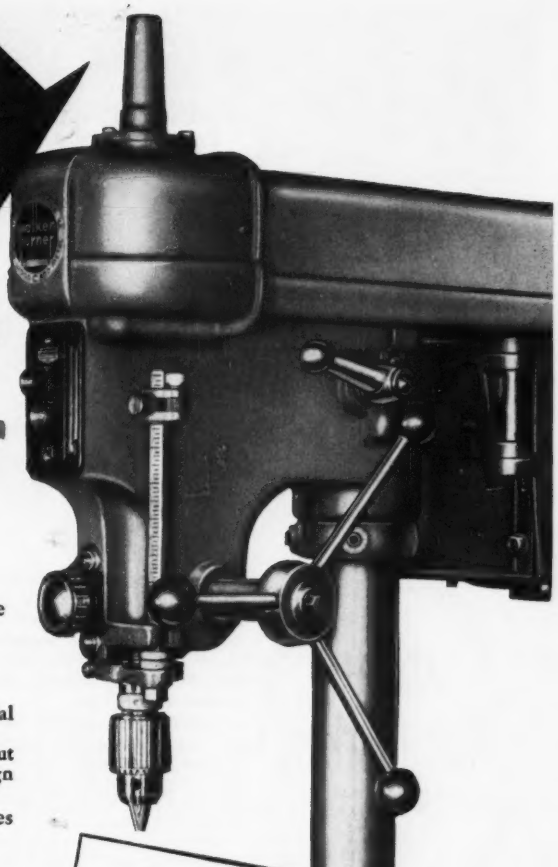

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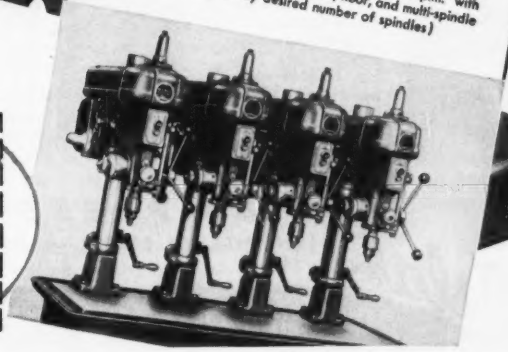

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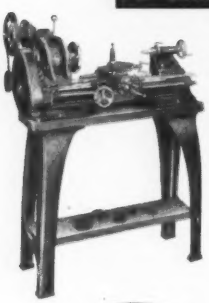

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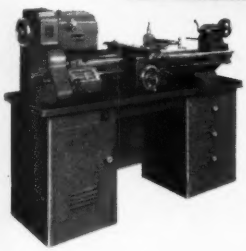

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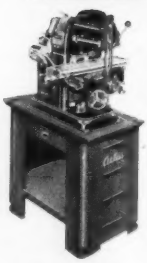

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Atlas DEPENDABLE QUALITY TOOLS SINCE 1911

The world is changing but is industrial arts?

Industrial Arts and Culture

By F. Theodore Paige
Chairman, Industrial-Arts Department, Ohio University, Athens

TRUCKS came the other morning to the vacant lot across the street. That evening when they left, a house complete with a bright blue roof stood waiting. Three wires connected the little house to a pole and it was ready. People moved in and another family became part of the community.

Books tell of other times—how after trees were felled and cut to length, the broad axe peeled the bark and notched the ends. After many weeks a roof turned water. The people stayed, the forests were cleared, and cities grew. It is said that they made a country that has no equal. They thought new thoughts and the years saw a new way of life spun into the fabric of a nation which has served as a pattern for many peoples. Thus American culture began.

The people who came to live in the little house across the street are a part of this culture. They live it, eat it, work in it, enjoy it, and help to make it what it is. What it becomes tomorrow they make out of their dreams today. They send their sons and daughters to a public school with the hope that the pattern will continue but with a finer thread.

Cultural Change

An analysis of this culture must be done quickly because what it is today may be entirely changed tomorrow. No other characteristic of this culture is quite so clear or quite so strong. No other characteristic has been so exploited to develop an attitude. People not only want change, but they expect it and demand it. Let us examine this dynamic pattern of life for the threads that hold together the mottled background. To unravel our pattern would but destroy it, so only in fancy can the threads be separated.

Culture today rests on four broad areas of material development. For lack of better names, these may be designated as transportation, communication, power, and manufacturing. Let us examine each area briefly for its contribution to the pattern.

The history of transportation is the story of culture on the move. It is the story of men and machines. The machines are commonplace today but the names of men who first made them pay off the 64-dollar question on the quiz programs. From these machines we get first-hand impressions. People see for themselves and know what they see. They carry the handiwork of all people for each to use, to know, and to appreciate. The automobile and the airplane are performing a more certain feat of reduction on the world than the magic potion that shrunk Alice.

The history of communication is the story of culture listening to and watching itself. The telephone stretched man's audio nerve across the country. Radio and television give us box seats at the opera and a look at our neighbor in the smoke-filled rooms of political conventions. The printed word is for quieter moments, for reflection on today's events or the wars of Sparta. To talk to a neighbor is to think his thoughts. He may be just across the back fence or living half way round the world. He may only exist as a word and a thought. The walls of time and distance have ceased to exist in our culture.

The history of power is the story of culture shaping a key to release itself. It is the story of finding nature's storage tanks of energy and of opening their valves to man's desires. Power releases man from daily drudgery. It gives him time to refine his tastes. First petroleum, then electricity, and now atomic fission have given man the sinews of a giant the ultimate picture of which no man can predict.

The history of manufacturing is the story of a culture feeding the appetite of a growing child. It is the story of mass production that gave to every man the ownership of material things for each to enjoy. It grew on wants that were no sooner satisfied than they produced more wants and the slow-to-start cycle now spins like a wheel. It respects no material limits; nothing is too trivial or too large.

A Fascinating Puzzle

The picture of our culture is a fascinating puzzle. We need only to visit the little house across the street to see it. The house and everything in it are the prod-

ucts of somebody's planning, research, and toil. But has our culture given man the inner satisfactions and peace of spirit he desires?

Society created an institution to educate its youth but was as unable to define its meaning of education as it was to predict its own direction. The prejudices and indecisions of leaders in every branch of education have in the past contributed to the postponement of inquiry about the finished product. A little more is known today why Homo sapiens ticks. This comes from the work of the physiologist, the biologist, the chemist, the psychologists, and their coworkers. While this little knowledge begs for more, the signposts have been set.

Pupils Make Something

The purpose of this paper is to examine the implications which these signposts have for the area of education designated as industrial arts. There is little agreement about what industrial arts is or what it should do. A cross-country traveler may visit schools along the way and find a gradual progression of work in almost every subject taught except industrial arts. There he may have difficulty in identifying what he sees. The equipment may be the kind to work in one or in many materials; projects may be the same or varied, simple or complex; and the question to the teacher about expected outcomes brings forth the same diversity of answers. Yet there is one point of uniformity—pupils are making something.

There are many leaders in the field who have found refuge in the shelter of academic standardization. There are others who, perhaps without understanding why, sense the value of learning by doing, yet who unwittingly hamstring the pupils' learning with the red tape of administrative and organizational details. There may be some who are willing to lose the identity of industrial arts as a subject to gain a process of learning. What viewpoint or combination of viewpoints will prevail in the years to come is a very real question being asked by the teachers on all levels of study. Perhaps the one thread of uniformity, coupled with a desire of enough teachers to chart the path for the future, will bring the answer. Let us look at what some of the steps may be that they will follow to find the answer.

"Industrial" or "Arts"?

One of the first problems will be a reinterpretation of the name "industrial arts." That name is the third edition in about 70 years and there are those who are looking for the fourth. The sequence of their appearance was "manual training," "manual arts," and "industrial arts." At present the emphasis is placed on the word "industrial." Shops have been equipped and courses conducted in an attempted imitation of industrial practice. When industrial work was introduced into the schools in this country, perhaps this imitation was partially justified. But one need only to visit any manufacturing concern today, regardless of the product made, to see the impossibility of simplifying the advanced technical work involved enough to bring it into the school room.

Strickler believes the emphasis should be placed on the second word "arts" and develops his philosophy around the "participative process of creation." He says:

> Art is the keyword—industrial, a minor adjective which indicates an area of application. . . . It is a method far more than content—the method of meeting and solving practical problems as they arise in the exigencies of an ongoing personal program.*

Would acceptance of this point of view weaken the act of transmitting our culture to succeeding generations? The concept of transmission includes motion, an act of carrying from one to another. Can culture be transferred from teacher to the pupil? If one believes that culture exists in materials, it can easily be passed from one to another. If one believes culture exists in people, then means for its transmittal must be found in the growth pattern of people. One is a static nonhuman element; the other a dynamic, never-ending development of behavior.

A New Psychology

An understanding of a psychology that pictures the learning process more accurately is a second condition which is probably the basis for any reconstruction of industrial arts. Such a psychology may be found developing as the interpretation of the relationship of the biological growth process to the learning process becomes better known. This is not a condition that can develop in any short period of time but will be forced to follow the sometimes irritating slowness of the pattern of evolution.

A new frame of reference for teaching will accompany this new psychology. It will start with the knowledge that learning begins with an internal need for which the pupil seeks satisfaction. This need will be redefined in cooperative terms to the satisfaction of both the pupil and the teacher. Deliberative action, expressed by the gathering of facts on which judgments are made and applied to the resolution of the need, is the manipulative phase of the project method. The learning process is completed when the pupil reexamines the fragments of his experiences, retaining or discarding by a process of differentiation that which he takes into his phenomenal self. This frame of reference does not allow for external control exercised by the teacher over subject matter. It abolishes the teacher's fixed ends and correct answers which foster the development of pupil attitudes of looking to somebody else for the correct answers. All culture has been developed by following the pattern of the biological growth process. It remains for education to learn to transmit it by the same process.

Molding Public Opinion

Industrial arts as a part of the total educational program cannot divorce itself from public criticism or praise given modern education. Responsibility for the public attitude towards schools should be shared by each subject field. However, certain fields are unique in their ability to mold public opinion to a greater degree than others. The practical arts enjoy this privilege. Teachers engaged in this area should capitalize on it.

A program for improved public relations carries an opening wedge for improvement in industrial arts. Public scrutiny of the visible products of an industrial-arts laboratory with an occasional "Why was this done?" will often be sufficient stimulus to a teacher to ask the same question of himself. This may often be the first of a long chain of events which will include increased support for public education, a wider base for selfselection of students in teacher education, and improvement in the programs of teacher-education institutions. Within the pupil experiences in his field, every industrial-arts teacher in the country has far more power than he ever suspects to contribute to the improvement of education as a whole. Belief in this power and knowledge of techniques for its release into constructive procedures should become a vital part of the professional courses of every new teacher.

American culture is the growing tapestry of the composite life of our country. For it to be woven with a finer thread requires the continuing program of readjustment of each of its parts. Industrial-arts teachers should accept their challenge. ★

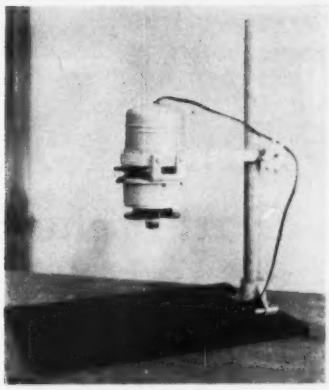
*Fred Strickler, "Industrial Arts Education for a New Age," unpublished brochure, Bradley University, Peoria, Illinois, p. 4.

Cooperation between four shops resulted in this

Photo Enlarger

By John Emmel

Connelley Vocational High School, Pittsburgh, Pa.



This photo was blow up from a 35mm negative on the enlarger shown which features a cold-light grid giving potent intense flat light.

A GROUP of boys in the drafting room were admiring some enlargers they saw in a photography magazine. One commented:

"Where could I get that kind of money?" Several others said the same thing.

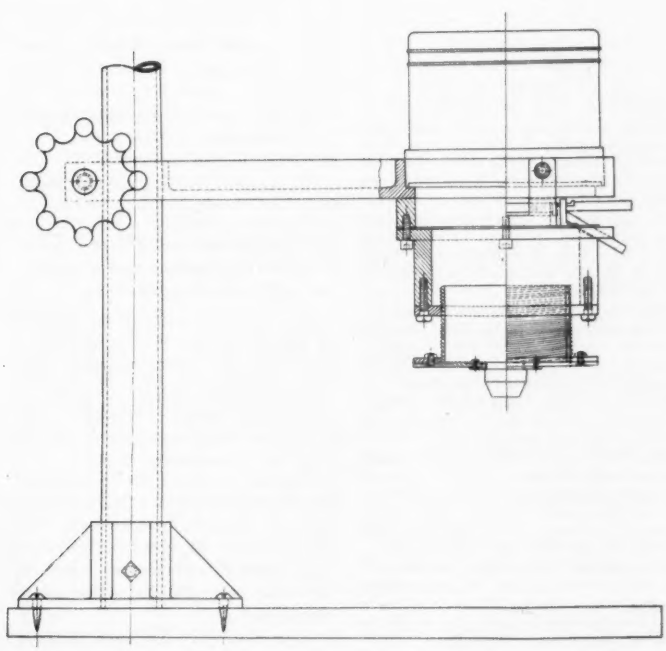
"If it cost less than half of that amount, would you be interested?" asked the teacher.

"Yes," they chorused.

"Would you be willing to do some extra work right here in the drawing room? Do you think some boys in other shops would be interested?" queried the teacher.

This started the general discussion from which the idea of the enlarger shown here was developed. The cooperation of the pattern, foundry, and machine shops was secured. A basic design was developed in the drafting room. It was then drawn up, carefully checked, and a pilot model made.

This involved all four shops as the drawings from the drafting shop went to the pattern shop where the patterns were made. The castings were kept simple with no cores or core boxes being needed. The foundry shop did the casting in aluminum. The castings were finished in the machine shop.



Three components that could not be made were purchased. These were the cold-light grid, the negative carrier, and the lens.

The job was then assembled and given a complete test in the darkroom. The picture of the enlarger shown here was reproduced from an 8 x 10 print which was enlarged from a 35mm negative.

Some features of the enlarger are noteworthy.

By purchasing a cold-light grid, a potent source of intense flat light was obtained and so no optical condensers were needed. An electrical timer can be used with it.

The use of a piece of 3″ pipe as a focusing device is cheap and efficient. Twelve threads per inch with one-eighth of a turn gives a fine adjustment of ⅛ x 1/12 or 1/96 which is approximately .01″.

The die-cast negative carrier, purchased from the Elwood Pattern Co., will hold all negatives from 35mm to 2¼ x 3¼ by using paper masks. This carrier has some lugs on its base which must be ground off to the approximate shape of the Masonite spacer.

It is a good idea to get the best 3½″ lens you can afford. All the components purchased totaled approximately $40.

More important than the cost was the way students learned about other shops and processes and developed a fine enlarger which compares favorably with any commercial enlarger.

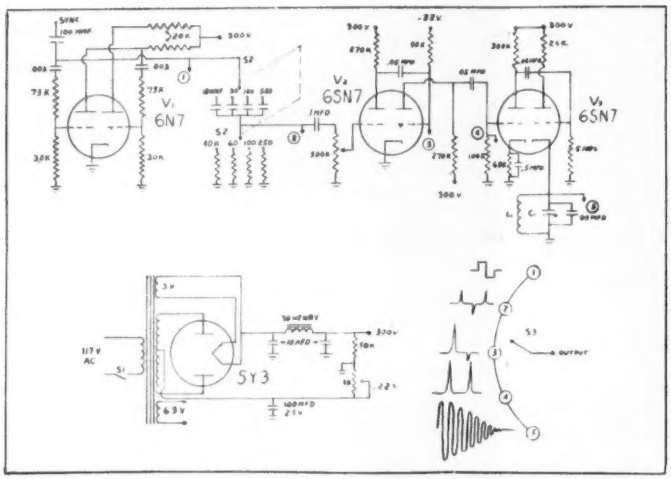
(EDITOR'S NOTE: Detail prints of this enlarger may be secured from the author at Connelley Vocational High School, Bedford Ave. at Fullerton St., Pittsburgh 19, Pa., by anyone wishing to make this excellent project. The cost price of the full set of prints is $1 plus postage.) ★

Use visual aids
to emphasize

Theory—An Important Part of the Electric Shop

By Morris Tischler

Forest Park High School, Baltimore, Maryland



This damped train and differential demonstration unit, built by a student, is used as a visual aid in the study of radio tubes. An explanation of the circuit theory is as follows:

Tube V_1 is a multivibrator whose frequency is determined by the 75K resistors and the .003 mfd condensers. The tube acts essentially as a saturation and cutoff amplifier alternately. The output at point No. 1 is a square wave between 1100 and 1400 cps.

The output of the multivibrator is fed into a peaking network consisting of four condensers (10-30-100-500m mfd) and four resistors (40-60-100-250 K ohms). The output of this section is a peaked wave which is variable in pulse width and amplitude and appears at point No. 2.

Tube V_2 consists of saturation amplifier and cutoff amplifier. No bias exists on the first section of the tube. This tube is driven to saturation and most of the upper part of the curve is removed. The pulse is inverted and fed into the second half of the tube, which is operating beyond cutoff. Point No. 3 will show the action of the saturation amplifier and point No. 4 will show the action of the cutoff amplifier.

Tube V_3 acts as a phase inverter-amplifier and an oscillator. The pulse which acts on the grid of the oscillator section is approximately 100 volts negative. The tube's (V_3) current flow is determined by the five meg resistors. In the cathode circuit exists an L-C combination whose frequency of oscillation is determined by the values L and .05 mfd condenser.

The capacitor C also acts to give slight variations in frequency. Inductance L can be varied over a large range of from 500 mh to 10 mh. The .05 condenser may have to be changed for extreme changes in L_1.

While current flows through the cathode, nothing happens. When the 100-volt negative pulse hits the grid of the tube, however, it develops a large bias across the five-meg resistor, which in turn drives the tube beyond cutoff. The L-C circuit during this time starts to oscillate and will gradually die out as the bias voltage on the grid diminishes. This action will reoccur each time a negative pulse is applied across the grid resistor.

It must be kept in mind that the frequency of oscillation should be several times the frequency of recurrence. If it is desirable to demonstrate the action of Q in the coil, then a variable resistor can be inserted in series with the coil at a set frequency. The action as seen on the screen will be the change in amplitude. The power supply is conventional in design and need not deliver exactly 300 volts.

TOO often the high-school shop is still thought of as a place where pupils are sent to use their hands. I like to think of the electric shop, or as I prefer to call it, "the electronics class," as an extended portion of the physics class. Students coming to this class should have to use all of their faculties and not just their hands.

The work should be centered about a carefully planned theory course. The project being built is really unimportant if the student hasn't gained knowledge which he can apply not only on another job but in general.

As a suggested outline of study I submit the following:

Basic Electricity

A. Introduction and safety information
B. Basic electricity
C. Applied mathematics
D. Dynamic electricity
E. Magnetism
F. Electromagnetism
G. Induction
H. Condensers

Fundamentals of Electronics

I. Vacuum tubes
J. Test equipment
K. Power supplies
L. Audio amplifiers
M. Radio frequency amplifiers
N. Oscillators
O. Frequency converters
P. Detectors
Q. AVC

AM Transmission

R. Transmitters
S. Antennas
T. Speakers, pickups, microphone
U. Batteries
V. Generators—motors
W. Applied mathematics (advanced)
X. AC circuits

Fundamentals of FM and TV

Y. FM transmission and reception
Z. Television reception

The course is designed for a period of two years. One year is devoted to basic electricity and fundamentals, while AM transmission and the fundamentals of FM and TV are covered in the second year. This is with six periods of class time, 45 minutes each.

The material is highly concentrated, but the students seem to find it more interesting than the regular basic electrical courses. As proof of this, more than 50 percent of those enrolled for the first year continue on for the second year of study.

It is impossible for any course of

study to be followed 100 percent. Portions, however, can be selected to fit individual needs. Actually the program is very flexible and from the complete outline I can select the portions best fitted to a particular group.

In several classes preradar courses have been given instead of TV, the request for the subject coming from students going into the armed services and the reserves.

In my classes I have worked out a series of experiments and projects to tie in with theory. In addition to these projects we have a group of visual aids which were built (and many designed) by the graduating students. These demonstrations are available at each theory discussion.

One of the many demonstration projects is shown. This particular project has been used with nearly all studies dealing with radio tubes. It was designed to give students a better understanding of the L-C circuit. For example, it has been found that students could not clearly see how an inductance and a capacitance could continue to oscillate after the current had been turned off in the circuit. Also the question of "Q" was a bit difficult to comprehend. By using this unit in conjunction with an oscilloscope, the student can see in a moment what would ordinarily require several periods of instruction.

The unit also can be used to demonstrate the following: difference in coupling condensers; the action of a tube operating at cutoff, as an oscillator, and operating at saturation; the principle of rectification and filtering; conditions resulting from overdriving an amplifier; pulsing, pulse widths, uses, and applications; square-wave production and its uses; signal inverting with the tube; and oscillations in an L-C circuit.

This unit, built by an eleventh-grade student, Carlton Haslbeck, has been used over and over again with different class groups. At each discussion the students are interested in some particular portion of the project.

This damped train project is only one of a series of visual aids that have been or are being developed. If we in our electric shops are to give the students what is demanded of them to know in their everyday life, we must have a change in course and use practical visual aids built up in the shop center, projects that can be used with each discussion.

More time should be devoted to discussions, the use of textbooks, notebooks, and references, and the taking of field trips. The simple take-home project is not really necessary. ★

Beginning students can make these

Modern Lamps

The lamp on the right is made from a piece of birch with the bark left on and is especially suited for a summer home or recreation room.

By Joseph Stepanski and William D. Chatfield

Student and Instructor, Teachers College of Connecticut, New Britain

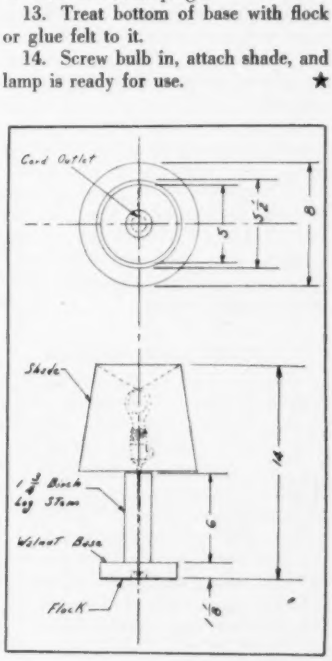
THE simplicity of construction of these lamps is not apparent from their trim appearance. The beginning student can achieve good results in a relatively short period of working time.

Materials are easy to procure and quite inexpensive. A piece of white birch with the bark on and approximately 1¾" in diameter is used in making the round-base lamp. This design fits into the decorative scheme of a summer cottage or recreation room very nicely and it is not necessary, of course, to turn it on the lathe. The stem for the square-base lamp is made from 1¾" pine, maple, or basswood. Both lamps have walnut bases.

Making these lamps provides the student with an opportunity to perform a large variety of manipulative activities. A consciousness of design is developed and work with electricity and wood is provided. The work of finishing the lamps gives opportunity for learning surface preparation, application of wood filler and stain, spraying lacquer, application of wax, and flock or felt treatment of the base. Educational values in consumer education can be developed by having the student purchase the parts and select appropriate wood and other materials.

The following general procedure is recommended for construction of either lamp:

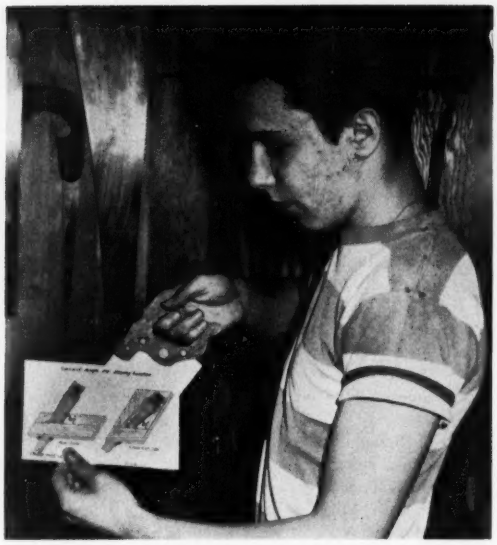
1. Select a piece of clear white pine, basswood, maple, or birch with bark on for the stem. Use dark walnut for the base.
2. Cut the base and stem to size.
3. Bore 7/16" hole through center of the stem.
4. Bore 7/8" hole half way through the center of the base from the bottom.
5. Bore 7/16" hole through center of the base.
6. Drill cord outlet from outside of base to recessed hole.
7. Spray lacquer sealer on base.
8. Spray lacquer on basswood stem. No finish preparation is necessary for birch stem.
9. Attach light socket to 3/8" pipe.
10. Insert pipe through base and stem. Attach cord to light socket.
11. Using a washer and nut, secure base to stem. Tighten nut.
12. Insert cord through cord outlet in base and attach plug.
13. Treat bottom of base with flock or glue felt to it.
14. Screw bulb in, attach shade, and lamp is ready for use. ★



This paper visual aid will help in teaching

How to Use the Saw

By Jerome F. Cosgrove
Herron Hill Junior High School,
Pittsburgh, Pa.



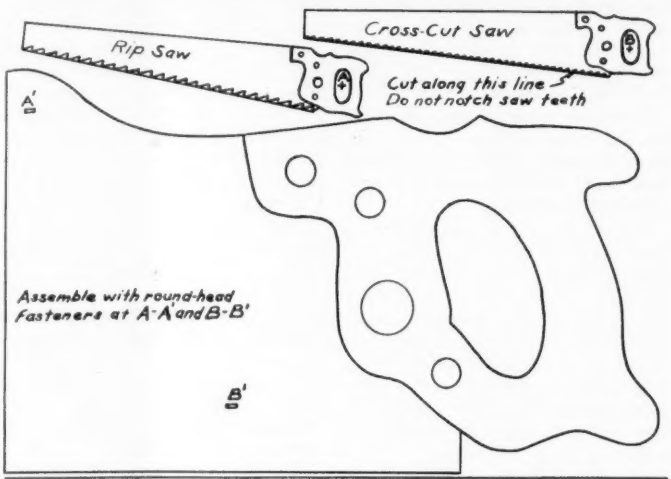
The large saw handle moves up and down to show proper saw angles by the movement of the small saws which are fastened to the large saw handle.

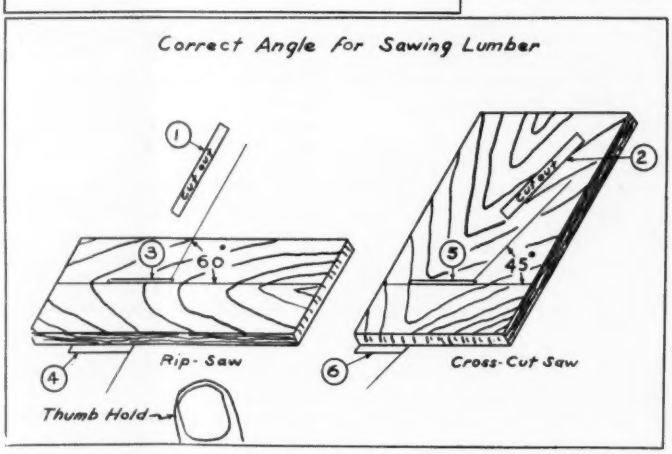
THE purpose of this inexpensive and easy-to-construct visual aid is two-fold: It gives the pupil opportunity to see for himself that there is a correct angle at which a rip saw and crosscut saw should be held for most efficient cutting. Second, this model can be used as a drawing project having more meaningful content than so many drawings of objects which are never seen or handled by pupils.

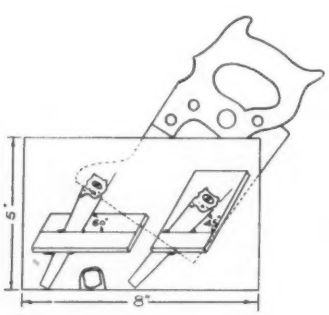
As the large saw handle is moved up and down, the small rip and crosscut saws will also move.

Materials used may be oak-tag, 5"x8" index cards, or a paper of equal stiffness. Crayons may be used to color the lumber, saw handles, blades, and screws. Round-head paper fasteners are used for assembly.

After the parts have been drawn, use a knife or razor blade to cut out slots 1 and 2. Then cut the narrow slots 3, 4, 5, and 6 through which the small saws are inserted. Push metal fastener tongues through *A* and *B* of small saw handles, through slots 1 and 2, and then through *A'* and *B'* of large saw handle. Bend down fastener tongues. ★



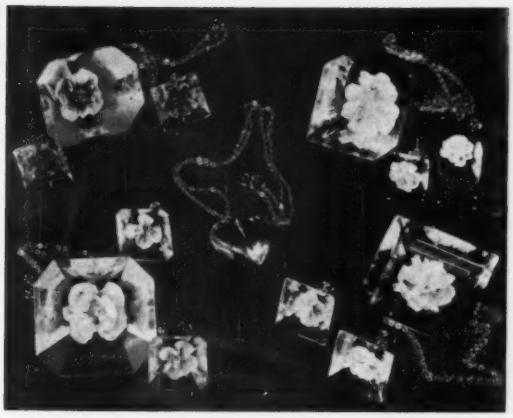




The acrylics will intrigue your students

Plastics in Industrial Arts

By Delmar W. Olson
Associate Professor of Industrial Arts, Kent State University, Kent, Ohio



Attractive costume jewelry can be made by internal carving.

PLASTICS, often considered substitute materials for wood, metals, leather, glass, and clay during the war have come of age almost overnight. Yet they have been a long time in growing up. The celluloid collar of the gay nineties is the grandaddy of the varied assortment of synthetics known as plastics. And most of them have been born within the last 10 to 15 years.

Plastics are no longer dubbed as substitutes. They are original materials compounded in the laboratory to have definite, specific characteristics. Some are hard, some are soft, some are rigid, some are flexible. Some resist acids, some resist alkalis. Some will burn, some will not.

Grandpa's celluloid collar was a fire hazard and no doubt when grandma said he was "hot under the collar" she wasn't fooling.

Celluloid photo film has been with us as long as most of us can remember. Back in the days when this cellulose nitrate was used for movie film, fires in the projection booth were common occurrences. The development of fire-resistant cellulose plastics apparently inspired chemists to hunt further, for now there are dozens of chemical compounds, all known generally as plastics.

Plastics are grouped into two basic families, thermosetting and thermoplastic. Until recently most of the plastics used in industrial arts have been of the thermosetting type. They harden with heat in forming and further heat has little effect on them. Catalin, Bakelite, Marblette are trade names of typical thermosetting plastics known technically as phenol formaldehyde cast resins.

To the industrial-arts student they have varied characteristics such as brilliant color, marbled mottling, transparency, translucency, and opacity. For all of their beauty, these plastics are often brittle, difficult to cement, and full of strains that are relieved by cracking.

The war stimulated research and development in the thermoplastics. The blisters, bubbles, and transparent plastic noses on bombers were typical uses of the new products. Plexiglas by Rohm and Haas and Lucite by Dupont are popular members of the thermoplastic group and are known chemically as methyl methacrylates, or acrylics.

The acrylics are really dreams come true for the industrial-arts teacher. Tough yet soft, stiff but flexible, easy to machine, simple to form, these plastics have about all the desirable qualities one could wish for in a single material. Even the most deeply colored will exhibit the sparkling transparency so characteristic of these plastics.

Both Plexiglas and Lucite are available in sheets, rods, tubes, and some special shapes and in an assortment of colors, transparent, translucent, and opaque. They can be sawed, filed, sanded, drilled, carved, turned, milled, and polished with regular wood and metalworking tools and machines. Most fascinating to the teacher and student is the very plasticity they possess when heated. You can tie a square knot in a heated rod as easily as in a hemp rope.

An ordinary baking oven can be used for heating since the temperature is kept fairly low—between 200-300°F. Too much heat causes permanent damage. On removing the plastic sheet from the oven, fan it through the air for a few seconds to chill and harden the surface. Then form it quickly. If it cools and stiffens before the forming is complete, it can be reheated and reformed.

Wooden dies lined with billiard felt are used when several pieces are desired.

When cementing acrylics the recommendations of the manufacturer should be followed, since it is a chemical process. Glacial acetic acid or ethelene dichloride are commonly used as solvent cements.

The soak method for cementing involves the dipping of one of the pieces into the solvent until a soft cushion is formed. Then it is pressed against the other piece and allowed to harden for three to five hours. The solvent can also be applied to the surfaces with a brush. The pieces are then pressed together to force out air bubbles. The joint usually hardens enough to allow further working in about 15 minutes.

Drive screws and selftapping screws are also used, especially when two different types of plastics are to be fastened together.

Polishing is done by using progressively fine abrasives until the final high gloss where a clean cloth buffing wheel is used. Acrylics polish so easily that one must be careful about overdoing it. They absorb heat from the buffer and tend to soften, so constant inspection is necessary.

Try the acrylics for a new teaching thrill. You'll find them delightfully different and increasingly inviting. ★

Coming Next Month!

SCHOOL SHOP in April will contain a special Portfolio of New Shops, showing in picture-story form the latest features in new shops that have been built.

The Suppliers Directory in this issue will be a constant help to you as it will give the names and addresses of firms in the field, classified by products handled.

Watch for this special New Shops and Directory issue!

IN THE Morning Mail . .

[Brief comments about SCHOOL SHOP and the field it serves are invited. Address the Editor, SCHOOL SHOP, Ann Arbor, Michigan.

Dear Sir:

I thought about Tom Diamond's recent comments in SCHOOL SHOP (December, page 30) on the IQ when I faced the vocational directors of the State of Indiana the other day and heard them discuss intelligent quotients. I found that they still place, in my judgment, too much emphasis upon IQ tests.

Why not think of the equipment for life as broken down into intelligence, human-relations abilities, and practical skills of various types? It is probably true that we cannot do much about the IQ, but certainly we can do a great deal about human-relations ability and the skills.

No IQ test that I have ever seen can check mechanical ability. Yet mechanical ability plays an important part in our life. Many an individual has a high degree of mechanical ability, yet this ability would not be tested in ordinary school programs.

Life activities call for a wide range of abilities, of which intelligence is only one.

H. G. McComb,
Indiana State Director,
Trade and Industrial Education
and Distributive Education,
Indianapolis

Dear Sir:

I am enclosing a number of coupons which I clipped from the October issue of your excellent magazine, of which I am a new subscriber . . . I should like to tell you a few things about our school.

We have 38 children, average age 14, who are recent arrivals in Israel. Most of them are orphans. All of them come from either Morocco or Tunisia; many were illiterate and almost completely unfamiliar with civilized life or its amenities. Our problem at the beginning was to teach them to undress before going to bed, to sleep in a bed, to wash occasionally, to use a knife and fork, or at least a spoon, to play simple group games, and to trust their teachers.

I find that through the use of tools, and work projects, we ("we" are five teachers) are most successful in breaking through the reluctance to cooperate or to study. Craft projects are our chief method of teaching arithmetic, manual dexterity, language, care of equipment, property in general, etc.

Although the ratio of teachers to students is very high, the character of the group makes it necessary to set up small classes, and give a great deal of individual attention. I, for example, teach arithmetic and geography, and crafts for a total of 44 class hours weekly.

I sincerely hope you can send the material, and that SCHOOL SHOP will continue to help us.

J. Criden,
Chief Instructor,
Kfar Blum,
Upper Galilee,
State of Israel

Dear Sirs:

The letter from John Pasakavitch in the January issue of SCHOOL SHOP on an industrial-arts philosophy seems to need a rebuttal. . . .

I am now in my seventeenth year of teaching industrial arts in public secondary schools, having taught in class A, class B, and class C schools in three different states.

I was trained in three different state universities specializing in the so-called "progressive educational and industrial-arts philosophies." At no place or institution have I been subjected to any other philosophy. *Raw, grass-roots experience has forced me to conclude that this philosophy is a false alarm and a hollow shell.*

It is a philosophy which, in the main, is promoted by college professors who have lost contact with the realities of public schools and their degree-conscious or short-experienced hangers-on. Specifically, I have concluded that the philosophy which Mr. Pasakavitch advocates is basically unsound.

Also I wish to clearly go on record as opposed to allowing the highly organized group behind this philosophy to steam-roller their program any farther into the public schools of this country.

Corwin S. Snyder,
Director of Industrial Education,
Grand Forks, N. D.

Dear Sir:

As I have retired, I will ask that my name be taken from the circulation list. I have enjoyed SCHOOL SHOP since its beginning. The editorial staff is to be congratulated for turning out this excellent magazine. Best wishes for its continued success.

A. C. Duncan,
Cleveland Heights, Ohio

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He Went Out to Meet Them

WITH FLARES AND WHISTLES and blaring bugles, the Reds had been attacking fanatically all night. Wave after wave they came, in overwhelming numbers.

By dawn, Jerry Crump could see that his position alone was keeping them from overrunning L Company. Twice he went out to meet them with his bayonet. Once he retook a captured machine gun. And four times he left shelter to bring in wounded comrades.

Now, an enemy soldier crept close unobserved. He lobbed a grenade. It landed squarely among the wounded men. Without a second's hesitation, Corporal Crump threw himself upon it, smothered the explosion with his own body, and saved his four companions' lives.

"I got hurt," says Jerry Crump, "but I got back alive. Because our armed forces have the finest medical equipment in the world—even at the front. And *you* helped put it there by investing in United States Defense Bonds."

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Corporal Jerry Crump U.S. Army Medal of Honor

Now E Bonds pay 3%! Now, improved Series E Bonds start paying interest after 6 months. And average 3% interest, compounded semiannually when held to maturity! Also, all *maturing* E Bonds automatically *go on* earning—at the new rate—for 10 *more* years. Today, start investing in United States Series E Defense Bonds through the Payroll Savings Plan at work.

Peace is for the strong! For peace and prosperity save with U.S. Defense Bonds!

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Diamond Dust

Abrasive comments from that doughty Scot, Tom Diamond, former head, Department of Vocational Education, University of Michigan, Ann Arbor.

Kids Like Convertibles

THERE was a period in our history when the desirability of a young man was determined by the type of plug he hired when he appeared of a Sunday to take his girl-friend for a ride in the wide open spaces beyond the village limits.

Those were exciting days with which the present generation is totally unfamiliar, and they have gone almost beyond recall. Moreover if the modern youth could possibly want to spend time in such a manner, he would have difficulty in finding a horse anywhere in the county.

If the young fellow of today would impress the fair lady, he must needs appear in a brilliant red or yellow convertible and the excursion must extend far beyond the ordinary limits of travel.

From this it would seem that times have changed, but it is significant to note that the youth of the community has adapted itself to the new conditions. This is as it should be, because no one with an ounce of sense wants to drive a horse and buggy on one of our modern highways.

What is true of the gallant swain of yesteryear applies to every phase of human activity. Each one of us must be on the alert constantly to adjust himself to changing conditions. If this generalization is acceptable, it would seem reasonable to assume that it applies equally to the activities carried on in our industrial-education shops.

But what do we find as we move from school to school? We observe that some of our teachers have introduced the study of new materials, new equipment, and new methods as they appear in our modern industrial world. There are those, too, who have changed their objective from making projects to that of educating children.

This is all to the good but, unfortunately, there still are some who are operating on the ideas that prevailed at the time when Johnnie was thrilling the neighbors with the skill he displayed in piloting his prancing steed through the village streets. Apparently they have not learned that the horse, as a means of impressing their contemporaries, is just as much passé as the free lunch which accompanied the obsolescent 5c glass of beer.

Teachers of this type appear to resent change in any form. They are still requiring their pupils to make broomholders and coathangers, notwithstanding the fact that the former is now considered to be antique, and the family closet is bulging with a metal variety of the latter, which are supplied in unlimited profusion, free, by the local cleaner.

Some of them, too, are devoting their time to the hopeless task of inspiring their pupils with a sequentially arranged group of wood joints which each pupil must make before he can hope to cater to the intense interest he has developed in making a boat or a model airplane.

Then, too, we have found pupils working with a complete lack of enthusiasm on another project which has all the characteristics of a forgotten age. We refer to the window-stick which was so popular in the latter part of the nineteenth century. This, notwithstanding the fact that most parents, and many teachers, have not the foggiest notion of what the critter is used for. Apparently the teachers who carry on this type of activity have not discovered that casement windows have come into common use, and that other types of windows are held in place by suitable built-in mechanical devices.

If activities of this nature are wrong,

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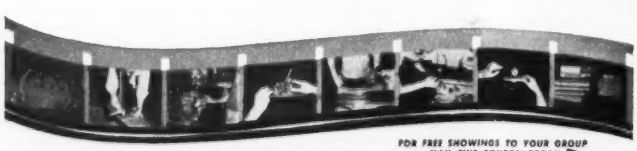

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the question that arises naturally is: What should a teacher have his pupils do in these modern times? It is unlikely that agreement can be reached on this matter. Nevertheless some teachers make an effort to relate what is done in class to some phase of modern industry. It may be in radio, in plastics, in silk-screen work, or in one of the many other types of work which are of interest to people today. And in whatever area the work is done, some effort is made to have the products functional in modern life.

Other teachers strive to capitalize on the present interests of their pupils, each pupil being permitted to choose and plan the project he would like to make.

Again we find some who have provided modern equipment to replace the older method of doing work by hand. And then we have others who have organized their shops on an industrial-production basis.

These and other practices which are designed to harmonize school shopwork with modern industrial practice may be good or bad, depending on one's point of view. However, they indicate that some of our teachers are alert and are attempting to keep pace with a forward-moving society. Other teachers who are still living in the Victorian era should bestir themselves, lest some enterprising antiquarian descends upon them and store them away in the archives as a link in the chain which binds us to the dim and distant past. ★

Jigsaw Jones

BEATS HELL OUT OF PLAYING WITH MATCHES, DON'T IT?
By Aaron Adams, Cincinnati, Ohio

To Our Readers

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Easily Made File Cleaner

A highly satisfactory file cleaner can be made very quickly from a common 20-d nail. Simply flatten out the point of the nail on an anvil and grind off square.

To use, lay the file on a table and hold the nail cleaner at approximately a 45° angle. This cleaner is especially handy for imbedded particles that cannot be removed with a file brush.—*Howard R. Schramm, Shadyside, Ohio, High School.*

Uses of X-ray Film

X-ray film is a material that can be used in the school shop for many purposes. Among them are: windows for wallets and pockets for name cards, envelopes for blueprints and information sheets, slip-in pocket linings to protect clothing from colored pencils, transparent covers for space sheets and pockets in scrap books. It also can be used for the protection of displays and photographs, and it makes excellent book covers and decorated place mats.

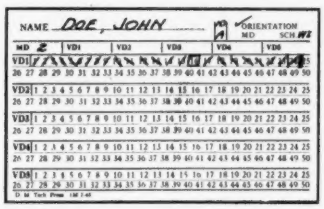
The film, which formerly had a nitrate base, now contains acetate on a safety film. The emulsion can be removed by a dye solution, using due precautions.

Most firms that make industrial X-rays sell this film to secondary refineries to reclaim the silver, and the cleared acetate sheet is then sold quite reasonably.—*Oscar Goering, Lansdale, Pa., Public Schools.*

Drafting Progress Card

Drafting instructors will find that a progress card furnishes a handy method of keeping a permanent record of their students.

Shown below is the latest one I designed for my vocational drafting classes. It keeps account of the student's progress, is a cumulative record of his entire two and one-half years work, and provides a permanent file on the student with pertinent data on the back.



VD1, VD2, etc., means Vocational Drafting 1, 2, etc. The numbers in horizontal rows are the plate numbers. They are checked off each week. Colored pencils can be used (red for odd weeks, green for even weeks) or reversed diagonal marks can be used if the marks are made with a pen. This shows the weekly progress of plate completion.

A vertical mark (as shown between No. 23 and 24) indicates a week with no plates handed in. Midsemester is shown by a small black area between numbers (as between Nos. 24 and 25).

Any number of other identification marks may be worked out. For instance a number can be outlined (as No. 16) to show a plate has been omitted by permission of the instructor.

Grades on plates which need notation can be inserted anywhere. At the end of the semester the final grade is listed in the VD1, 2, etc. space above.

At the top of the card, in addition to the student's name, there is space to record when he took our orientation course (10-A) and the school he came from. The MD would be checked if he had taken ninth-grade mechanical drawing. The number after the MD at the left indicates his grade in 10-A.

Pertinent data may be kept on the

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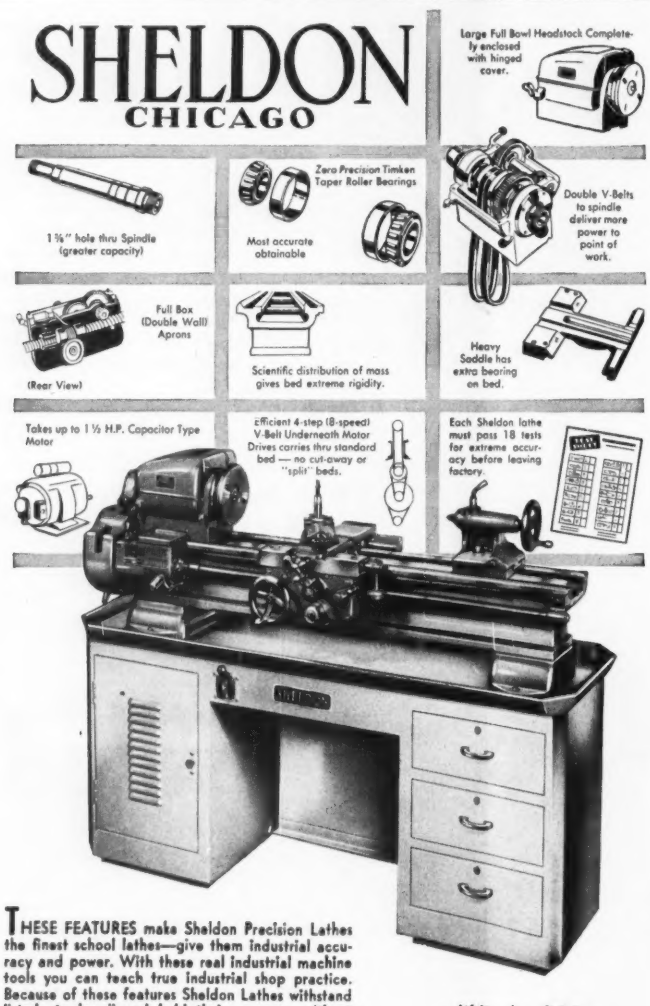
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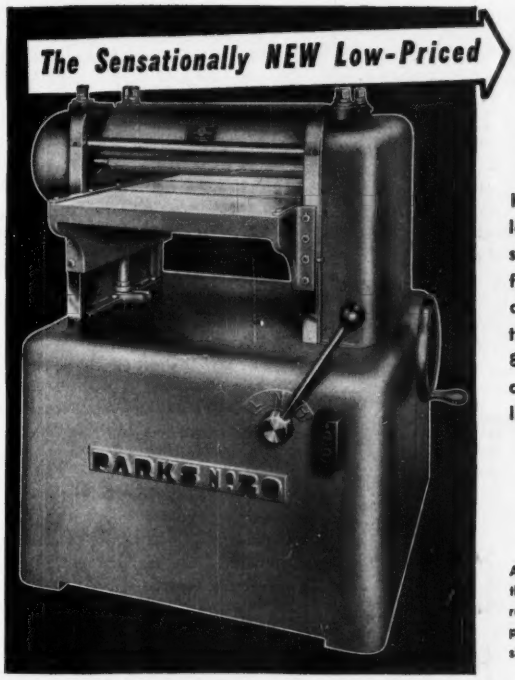

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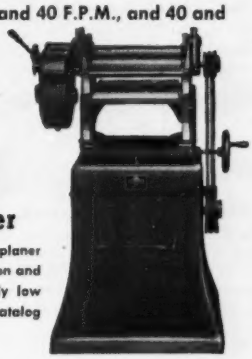

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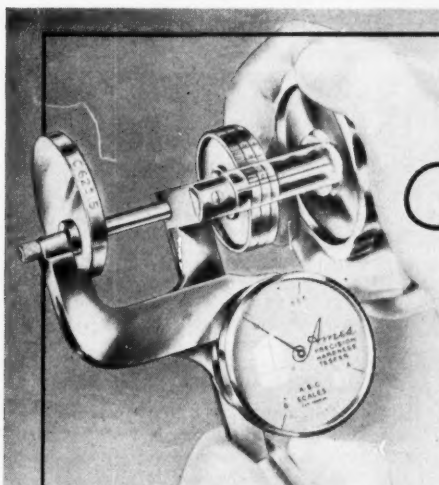

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back of the card. For example, the student's home address, telephone number, cooperative employment, grades in related work, graduation date, where employed, etc.—*William D. Mayo, Des Moines, Iowa, Technical School.*

The Idee-Swap Club

A give-and-take program of shop-tested ideas and project plans has been instituted for the industrial-arts teachers in Utah. Called the Idee-Swap Club, the plan provides that worthwhile ideas submitted will be duplicated and sent out to each instructor participating. The program, started in October, 1952, will continue until October, 1953.—*Algot E. Anderson, director of industrial arts education, State of Utah.*

A Remodeled Tool Cabinet

The picture below shows how we remodeled the top of an old tool cabinet into a modern looking showcase.

As can be seen, there was very little that had to be done with the exception of remodeling the doors, giving a light finish to the interior, and adding the special display shelves.—*Norman V. Nichols, New Hartford, N.Y., Central School.*

Layout Dyes

Here's a suggestion concerning layout dyes for metals.

For bright metals, mix a few drops of concentrated gentian violet solution (obtainable at the local drug store) in shellac, containing five parts alcohol, one part shellac. This is both reliable and cheap.

For layout work on black metals such as band iron and iron sheet, mix whiting powder in water to the consistency of light cream.—*Edward M. Myslivecek, Garden City, N.Y., High School.*

Linotype Maintenance

In the school print shop the linotype student should be taught to make minor repairs on the machine as well as operate the keyboard.

This not only saves the instructor's time, enabling him to work elsewhere in the shop, but also saves the machine. Many large repair projects caused by improper care of machines can be eliminated, since the student is familiar with the parts.

It is also wise for the instructor to check the machine regularly and to do preventive maintenance. This saves time, money, and wear of machine.—*Louis S. Tassi, Department of Printing, Arkansas State College.*

Good Luck

A small horseshoe magnet can be put to many useful services about the school shop. For instance, hang one on the scroll-saw table where it can be quickly reached. It can be used to remove broken blades from the chuck or from hard-to-reach places.—*Roger M. Woodbury, Wellesley Public Schools, Wellesley Hills, Mass.*

An Off-Set Chisel

Occasionally one needs an off-set chisel to cut around a corner or clean out the bottom of a mortise or groove. An easy, inexpensive way to make one is from an off-set screwdriver. These screwdrivers are inexpensive but will hold a fairly good cutting edge.

Saw off one end of the driver and file enough of a point so that you can force it into a handle. File or grind the remaining tip to a chisel point. Touch it up frequently on a stone to keep it sharp.—*Isaac Carter, Sabraton, W. Va., Junior High School.*

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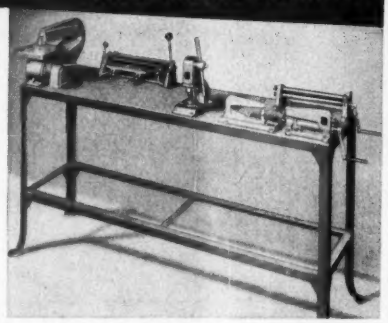

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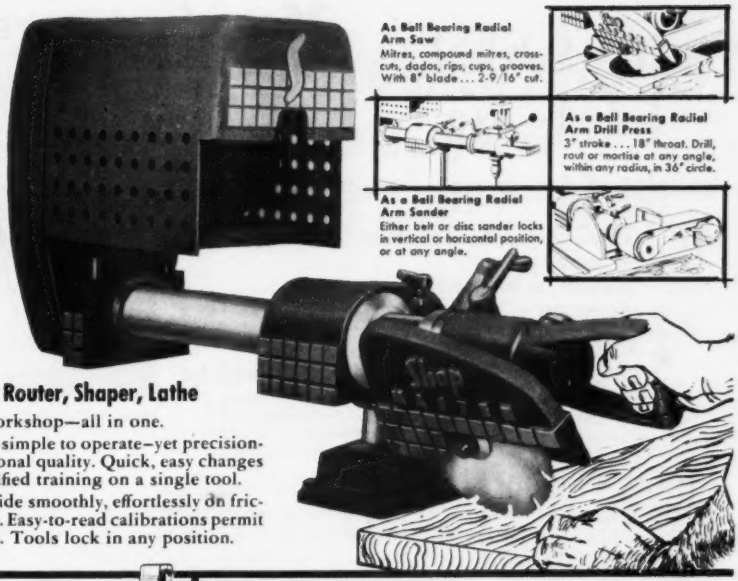

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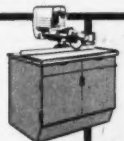

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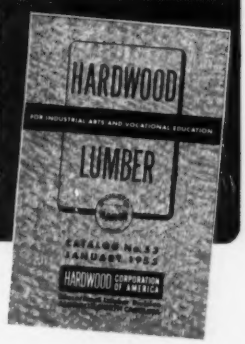

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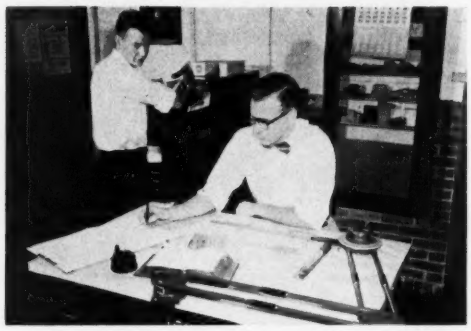
Manufacturers' Literature

A Drafting Aid

By
Henry J. Beukema
Assistant Professor of Drafting, Western Michigan College, Kalamazoo



These drafting class students are using manufacturers' catalogs and pamphlets to develop a design using commercially produced parts.

WITH standardized parts becoming more important and with manufacturers relying more and more on other producers to furnish items necessary to complete the assembly of their product, the value of trade literature today to drafting students and instructors has become apparent.

An extensive file on such literature in the high-school drafting room provides a wealth of technical information not usually available in the textbooks. When a student is given the job of developing a product, he is alert to the possibility of using a commercially produced component in his assembly of parts. Since he must provide complete and accurate specifications for these purchased parts in the bill of materials or parts list, the catalog becomes his most reliable source. The catalog and other sales literature, therefore, offer valuable training in developing a product, in locating sources of supply, and in the proper methods of specifying and ordering parts.

One word of caution should be emphasized about using manufacturers' material as drafting aids. Care must be exercised by the instructor to maintain an impartial attitude; that is, he should not show preference for any particular product or supplier.

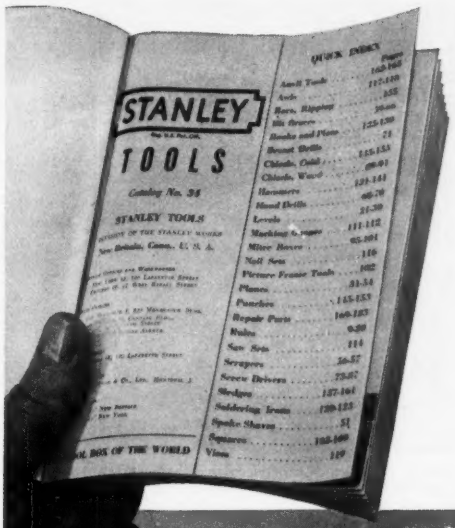
There are several ways to obtain material so that students in the drafting room can have at their fingertips a file of useful engineering and sales data equalling that of the engineering department of an up-to-date business firm.

The manufacturers of practically all nationally advertised brands of machine tools and equipment subscribe to a service such as Sweets Catalog Service in which their sales and engineering literature is combined for distribution to the various divisions of modern manufactures, such as product designers, mechanical industries, etc. The electric equipment manufacturers combine their literature in the Pre-File Electrical Catalogs published by McGraw-Hill Catalog Service. In addition, local hardware and mill-supply companies furnish combined catalogs of the products they distribute. All these catalogs are usually available to the engineering department of any industrial establishment and certainly should be found in every high-school drafting room.

Much helpful informational material also can be obtained from the manufacturers' sales representatives in each locality. The national trade magazines such as *American Machinist, Machine Design, Product Engineering,* etc., compose another source. All these periodicals have "reader service cards" by which pamphlets, brochures, and information from the advertisers can be obtained.

On the whole, manufacturers are anxious to furnish information to schools. They feel it is economically worthwhile to have their trade names and products placed before the students. They know that a student confronted with, say, the Curtis Woodwork Catalog in an architectural drawing class will probably think of Curtis later when he builds his own home. A machine drawing student specifying a Dodge Type E pillow block on his assembly drawing will, if he pursues the trade, eventually be in a position to specify a Dodge product in similar applications.

The use of manufacturers' catalogs in the school drafting room proves valuable, therefore, from both the school's point of view and the manufacturers' point of view. ★



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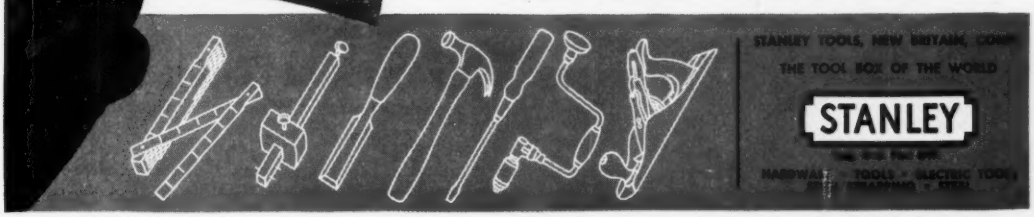

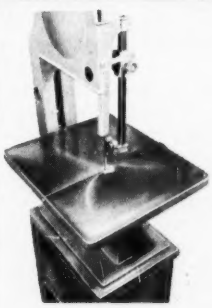

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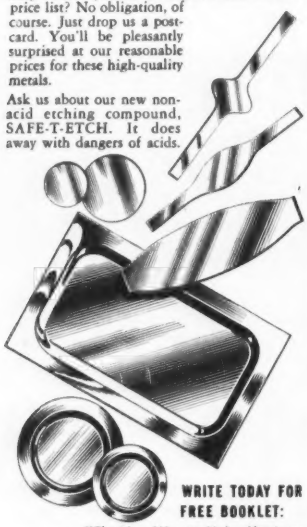

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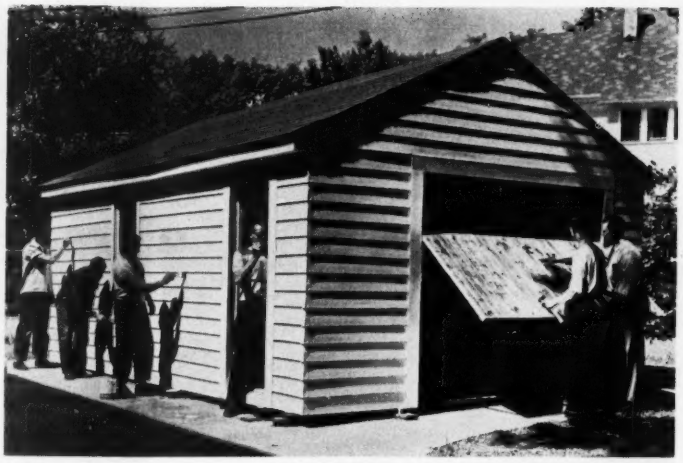

Seniors in the practical-arts course at Edgerton, Wisconsin, High School putting the finishing touches on a garage which they built on contract as their concluding shop activity for the year.

Curious Citizens Got Their Answer

By Omer Benn

Formerly industrial-arts teacher at Edgerton, Wisconsin, High School and now at Lyons Junior-Senior High School, Clinton, Iowa.

CURIOUS passers-by stopped at the Edgerton, Wisconsin, High School grounds to find out what was going on a few months ago. It was evident that a small building was under construction by a group of senior students, but the unspoken question was in their look "What is the school board thinking of, letting a bunch of kids do this work when they should be at their desks?"

The answers given by those kids sent the local citizens away with added respect for their school system and for modern methods of instruction. The boys enthusiastically explained that they were constructing a garage under a contract for a private citizen and that the work was the culmination of their four years of practical-arts instruction.

During the nine weeks it took to complete the project with the class meeting one hour a day, every member took part in all of the operations involved. The first two weeks were spent in drawing the plans, making out the bill of materials, and in studying building practices and procedure. The agreement with the purchaser included stipulations that he furnish all materials and move the building when it was finished.

After the plans were completed, a demonstration was given of the lay-out of a building. Local contractors and carpenters were enthusiastic and helped in many ways. For example, one furnished a transit for use in leveling the building. Others offered advice as it was needed. There was no union in the community, so help was drawn from individual carpenters.

Each student gained practical experience in the use of mathematics as related to carpentry, figuring materials, and drawing the plans. He learned how to estimate costs and later to determine actual costs. Experience was gained in obtaining a building permit and in making out a bill for materials. Safety was stressed.

The project stimulated the interest of fourth-year students—often a problem because they feel they have covered the field. It also eliminated a financial problem for many who feel that they cannot afford the cost of materials for a pretentious woodworking project. Most important, it may have stimulated interest in a hobby that can be a life-long enthusiasm and a real asset when the boy establishes his own home.

From watching this garage rise on the school ground, our community has learned more about our practical-arts program and acquired much interest in our schools. ★

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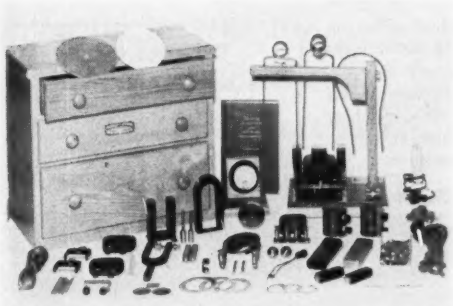

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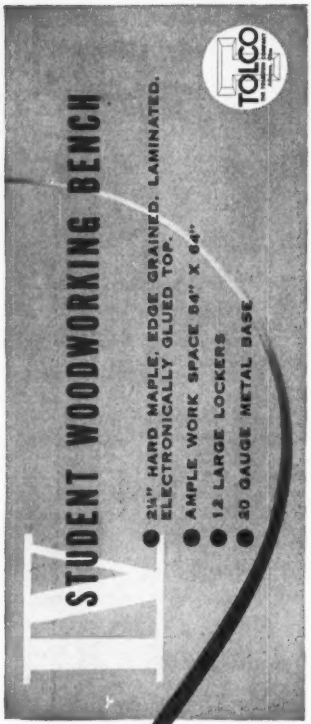
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News

HAPPENINGS IN INDUSTRIAL EDUCATION

New Bennett Co. Head

RICHARD H. SIMPSON has been elected president of the Chas. A. Bennett Co., Inc., well-known Peoria, Ill., publishers, to succeed L. L. Simpson, who died August 4, 1952.

Richard Simpson joined the company in 1934 when it was known as the Manual Arts Press, and he became director of the company in 1939. He has been vice-president since 1948.

Iota Lambda Sigma Officers

HERMAN F. HINTON, state supervisor of T&I education, Florida, is the new president of Iota Lambda Sigma, professional fraternity in industrial education.

Other officers are: Dean Lemon of Millersville, Pa., State Teachers College, vice-president; Clyde Wilson of the University of Tennessee, Knoxville, secretary-treasurer (re-elected); and Leonard R. Booker of Clemson College, South Carolina, historian (reelected).

W. L. Newton, director of vocational education, Meridian, Mississippi, is chairman of the National Advisory Council for 1953.

New Vocational School

THE new F. W. Olin Vocational School in Alton, Illinois, was dedicated November 6 in a ceremony held in the high-school auditorium. Spencer T. Olin, first vice-president of the Olin Industries and son of F. W. Olin in whose honor the building was named, was the main speaker at the ceremonies.

Minnesota Assns. Elect

BOTH the Trade & Industrial Association and the Industrial Arts Association of Minnesota recently elected officers for 1953.

C. W. Pope of Thief River Falls now heads the T&I Association. Reuben Schafer of Minneapolis Vocational School is vice-president, and Ray Davoli, St. Paul, is secretary-treasurer.

The new president of the IA association is Douglas Soule, Montevideo. Vice-president is Karl Ruthenbeck of Virginia, and secretary-treasurer is Ray Zakariasen of St. Louis Park.

Ohio Spring Meeting

"SCHOOLS and Industry Work Together" will be the theme of the spring meeting of the Northeastern Trades and Industry Section, Ohio Vocational Association, to be held April 24-25 in Youngstown, Ohio. Walter Barnhill, supervisor of trade and industrial education, Youngstown, will be chairman.

Exchange Teachers

Two industrial arts teachers are included among the 100 American-British exchange teachers for the 1952-53 academic year. They are Paul R. Dickerson of the McKinley Junior High School, Pasadena, Calif., who is changing positions with a teacher in Wales, and Samuel O. Webster of Central State College, Edmond, Okla., who is exchanging places with a teacher in the Training College, Loughborough, Leicester.

To Head California IE Assn.

LEE W. RALSTON, director of trade and industrial education of Los Angeles County, has been elected president of the California Industrial Education Association for 1952-53. Vice-president is J. K. Barnette, director of industrial education, Modesto City Schools.

Kansas IE Assn. Officers

THE 1952-53 president of the Kansas Industrial Education Association is H. A. Starkey, industrial-arts instructor at Great Bend High School. Leonard Selig of Augusta is vice-president and Donald W. Lake of Coffeyville is secretary-treasurer.

Convention Calendar

New Jersey Vocational and Arts Association, Asbury Park, March 19-21.
California Industrial Education Association, Santa Barbara, March 20-21.
Ohio Industrial Arts Association, Neil House, Columbus, March 26-28.
Illinois Vocational Association, Peoria, March 26-28.
Tennessee Vocational Association, Nashville, March 27.
South Carolina Vocational Association, Spartanburg, March 27.
Texas Vocational Association, Texas Hotel, Fort Worth, April 2-4.
Michigan Industrial Education Society, Civic Auditorium, Grand Rapids, April 16-18.
New York State Vocational and Practical Arts Association, Hotel Statler, New York City, April 23-25.
Indiana Industrial Education Association, Civic Center, Hammond, April 23-25.
American Council of Industrial Arts Supervisors, Statler Hotel, Detroit, April 28-29.
American Council of Industrial Arts Teacher Education, Statler Hotel, Detroit, April 29.
American Industrial Arts Association, Statler Hotel, Detroit, April 29-May 2.
Georgia Vocational Association, Municipal Auditorium, Macon, June 11-12.
Pennsylvania Vocational Association, Eagles Mere, June 17-19.

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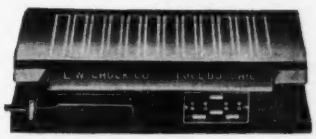

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"Oliver" No. 72D Borer

This motor-in-head machine bores holes up to 2" dia. 6" deep, in center of 36-in. stock. Table has 12" vertical adjustment, swivels completely around and tilts to any angle up to 45°. The motor-head spindle unit delivers full power to bit. Air blast keeps work clean. Write for Bulletin No. 72-D.

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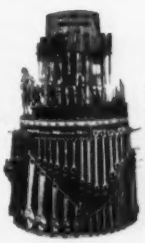

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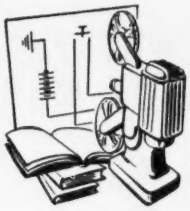

Books:

High Fidelity Simplified. Weiler. New York: John F. Rider, Publisher, Inc., 1952. Pp. 208. $2.50.

This book is a discussion for the layman of the wide range of frequencies obtainable through "high fidelity." Topics covered include loudspeakers, amplifiers, record players, tuners, and tape recorders with much practical information on each.

It is a book that will be read with interest by anyone who desires to increase the enjoyment received from musical programs that come through radio or recording. It is not too technical and, therefore, it comes within the comprehension of the layman.

The book is not designed for classroom work, but will provide good related material for pupils who are working in the field of radio, particularly those who are "hi-fi" fans.

Gem Cutting (Second Edition). Willems. Peoria, Ill.: Chas. A. Bennett Co., 1952. Pp. 224. $4.50.

This book was published originally in 1948. It is made up of details explaining how to do lapidary work. This explanation is clarified by numerous illustrations.

The book should be of value to the hobbyist who is interested in lapidary work, and it should suggest to industrial-arts teachers a type of work which can bring additional interest to the school-shop program.

Furniture Decoration Made Easy. Hallett. Boston: Chas. T. Branford Co., 1952. Pp. 146. $4.95.

This book is a work manual with detailed instructions and practical, full-scale patterns for use by anyone interested in beautifying furniture, either new or old.

Designs are provided for the ornamentation of chairs, settees, bureaus, and other pieces of furniture. The finishing materials described are easy to handle, and the decorating methods suggested have been tested and have been found to be quick and efficient.

Teachers who include furniture making in their courses should have this book in their shop libraries as a reference.

How to Work with Tools and Wood (Revised Edition). New Britain, Conn.: Stanley Tools, 1952. Pp. 192. $2; $1.35 in quantities of ten or more.

This how-to-do-it book has been very popular with students and home craftsmen as it gives explicit information in readily understood language on the use of hand tools in project construction and home mechanics. This new edition is completely revised and covers the selection of basic tools and their use and care as well as material on the construction and finishing of shop projects.

1952 Radio Diagrams and Servicing Information. Beitman. Chicago: Supreme Publications, 1952. Pp. 168. $2.50. Paper bound.

This is a complete compilation of the most-often-needed radio diagrams. Teachers of radio in our public schools will find it useful as a teaching aid, and it should have a place in the reference library in school radio shops. It is designed for the service man, but it would be invaluable to the amateur who enjoys making the adjustments on his own equipment.

Bench Metal Work. Smith. Bloomington, Ill.: McKnight & McKnight Publishing Co., 1952. Pp. 72. $1.00.

This is a revised edition of *Units in Bench Metal Work*, which was published in 1939. Units cover hand-tool operations. Processes are described and several projects are included. Robert E. Smith is Emeritus Professor of Education at Ohio State University.

Woodwork for the Beginner. Gottshall. Milwaukee: Bruce Publishing Co., 1952. Pp. 139. $4.00.

This book contains 30 woodworking projects suitable for beginners. The material is organized on a job-sheet plan with complete directions concerning the procedures to be followed. The directions are brief but they are sufficiently adequate to make them clear and the projects are well illustrated by means of drawings and pictorial sketches.

Franklin H. Gottshall has had considerable experience both as a teacher and as a craftsman. He is now teaching industrial arts in his home town of Boyertown, Pennsylvania.

Principles of Radio (6th Edition). Henney and Richardson. New York: John Wiley & Sons, Inc., 1952. Pp. vii + 655. $5.50.

In this edition the text has been completely rewritten, and chapters have been added on electronic test equipment, f.m., television, radar, and wave-shaping circuits.

The major emphasis is on the fundamentals of basic radio circuits. A series of problems is included at the end of each chapter.

Keith Henney is Consulting Editor, *Electronics*. Glen A. Richardson is assistant professor of electrical engineering, Iowa State College.

Elementary Metallurgy (Second Edition). Frier. New York: McGraw-Hill Book Co., Inc., 1952. Pp. x + 258. $4.50.

The new features of this edition include an enlargement of the chart of blast furnace reactions, more stress on the origin of steel and the influence of carbon. The original material has been rearranged so as to place more em-

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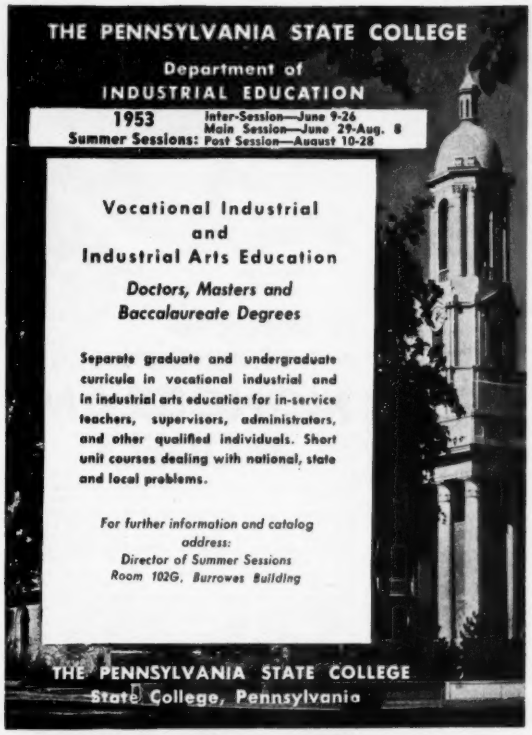

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phasis on the relationship between the topics covered and other new processes are included. Questions and references are given for each chapter and a new list of motion pictures and film strips has been added.

This is an excellent book for beginners in the subject, and should be well received by teachers of related subjects.

W. T. Frier is an instructor in metallurgy at Pennsylvania State College.

House Construction Details (Third Edition). Burbank. New York: Simmons-Boardman Publishing Corp., 1952. Pp. 388. $4.95.

The new features of this third edition include a number of illustrations of new building materials, and methods of erecting prefabricated houses. Up-to-date information on painting, heating, and insulation is provided also. The book has been enlarged. It has 600 more illustrations, and the whole text has been brought into harmony with current practice.

Nelson L. Burbank was formerly an instructor in the Building Vocational High School, Cincinnati, Ohio.

Audio-Visuals:

Shell Motion Picture Catalog is a descriptive booklet covering the various films available on free loan from the Shell Oil Co. All of the motion pictures are 16mm sound and are accompanied by a teachers' manual and wall chart. Twenty films are available on a variety of topics including oil production, aviation, and traffic safety. Available from the Shell Oil Co., 50 West 50th St., New York 20, N.Y.

Visual Teaching Aids for Radio and TV, consisting of a set of 33 transparencies 7"x 7", have been produced for use with the new textbook, *Radio and Television Receiver Circuitry and Operation* by Ghirardi and Johnson. The transparencies are mounted in heavy fiberboard and may be shown with either an opaque or other projector. The tie-in of the transparencies with the text through identification numbers makes the instructor's job easier. Schools adopting the textbook in quantities of 25 or more will receive a set of transparencies without charge. Further information may be secured from J. Edwin Pasek, Sales Director, Rinehart Books, Inc., 232 Madison Ave., New York 16, N.Y.

Pamphlets:

Rights of the American Worker by John A. McCarthy, assistant commissioner for vocational education in New Jersey, is an 80-page booklet containing a summary of the development of the labor movement in this country and an exposition of the major legislation affecting workers at this time such as the Workmen's Compensations Acts and the Taft-Hartley Act. The presentation is impartial and would make excellent reference material for social-studies and vocational classes. Published for $1 by the American Technical Society, Chicago 37, Ill. Paper bound.

Electrical Demonstrations You Can Perform is a 32-page booklet containing 25 demonstrations including wiring, small-motor care, the care and use of home appliances, lighting, and electrical farm equipment. Background information is given for each demonstration and step-by-step procedures are suggested. Available from Westinghouse School Service Dept., 401 Liberty Ave., Pittsburgh 30, Pa.

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JAMES T. GEARON, head, Reports and Analysis Section of the Vocational Div., U.·S. Office of Education, died December 23. He was appointed to the Vocational Division in 1941 and at the time of his death was preparing reports on schools receiving federal vocational-education funds.

THOMAS R. HARPER has been appointed educational sales representative on the west coast for Stanley Tools of New Britain, Conn.

FRED RICHMOND, associate professor of industrial arts education at the New Jersey State Teachers College at Newark, has retired after 32 years.

JAMES L. BOONE, former director of industrial education at the Laredo, Texas, Junior College, and REX HALL, graduate of Texas A & M, are new members of the department of industrial education at Texas A & M.

D. W. FOX has been appointed coordinator of East High Trades School in Cabell County, W. Va.

EDWIN D. GROVES, industrial-arts instructor at Winfield, Kans., High School, has accepted a two-year appointment in the Point IV Program as an industrial-vocational advisor in Rangoon, Burma.

DALE WALFRON, director of adult and vocational education for the Hayward, California, Union High School District, has been appointed principal of the John A. O'Connell Vocational and Technical Institute by the San Francisco Board of Education.

CARL J. SCHAEFER, former local supervisor of trade and industrial education in Sandusky, is now consultant of instructional materials development in the trade and industrial curriculum laboratory at Ohio State University. Mr. Schaefer replaces JOHN DOUGHMAN who has resigned to accept a position in Brazil.

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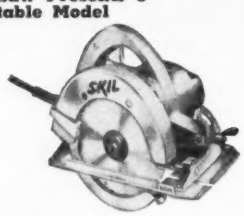
News from INDUSTRY

Skilsaw Presents 6" Portable Model



SKIL Corp. has introduced a new 6" portable electric saw, Model 586, featuring a die-cast aluminum alloy housing, ball and self-lubricating bearings, safety trigger switch, automatic telescoping blade guard, guard retracting handle, built-in depth and bevel adjustments and brackets for right or left-hand rip-fence use.

Cutting capacity of the Model 586 is adjustable from 1/16" to 1-15/16" with a 45° capacity of 1-7/16". Overall length is 10" and weight is 10 lbs. Standard equipment includes combination blade, blade wrench, and three-conductor rubber covered cord. It is powered by a universal type motor and has a speed of 6000 rpm.

For additional information write SKIL Corp., 5033 Elston Ave., Chicago 30, Ill., mentioning SCHOOL SHOP; *or check no. 47 on the coupon.*

Electric Motor Training Kit Available

Electric Motor Craft, 115 Croydon Ct., Silver Spring, Md., is marketing an electric motor kit composed of all the essentials for proper training and which, when assembled, can supply power for numerous appliances and power-driven tools. The *Manual* which accompanies the kit gives complete instructions for assembly and operation.

Approximate time for study and assembly of the motor varies from eight to ten hours; and where motors are disassembled and used by a new class, replacement-part kits and new *Manuals* are available.

For more information write P. C. Wright, at the above address, mentioning SCHOOL SHOP; *or check no. 48 on the coupon.*

Austin Will Distribute Swedish Machines

The appointment of Austin Industrial Corp., as exclusive U. S. and Canadian distributor for SAJO Horizontal Milling machines from Sweden has been announced. These medium-duty, high-speed machines are available in plain and universal models, are of sturdy construction, and are said to meet the highest requirements of accuracy. All sliding surfaces are hand scraped. Allowable tolerances to which the machines are tested compare favorably with the "best-known" American makes.

Table size for both plain and universal millers is 41½" x 9¼". Longitudinal power traverse is 24½" for the plain miller and 27½" for the universal. Transverse and vertical travel either by hand or power feed are respectively 8¼" (4½" with overarm braces in place) and 19".

Power is transmitted by a three-hp motor. Twelve spindle speeds from 36 to 1540 rpm are available. The spindle has American Standard No. 40 milling-machine taper. It is mounted in SKF precision roller bearings and is equipped with SKF thrust ballbearings. Machines are available with longitudinal power feed only or with power feed in longitudinal transverse or vertical directions. Twelve feed rates are available. All screws and dials are calibrated in inches.

For additional information please write the Austin Industrial Corporation, 76 Mamaroneck Ave., White Plains, N.Y., mentioning SCHOOL SHOP; *or check no. 49 on the coupon.*

Lightweight MallDrill Doubles as Sander

Designed for both heavy and light operations, a new portable power MallDrill model 127 is housed in lightweight aluminum alloy and features ac-dc motor, selflubricating bearings, geared chuck, trigger-type switch, contoured bar handles, and a spindle speed of 500 rpm. It comes equipped with a 10', three-conductor rubber-covered cord and plug.

For polishing and sanding, the MallDrill Model 127PS comes with the same equipment except geared chuck and a 7" backing pad, 7" sheep wool bonnet, three abrasive discs, and adapter.

Additional information may be had by writing the Mall Tool Company, 7725 S. Chicago Ave., Chicago, Ill., mentioning SCHOOL SHOP; *or check no. 50 on the coupon.*

Atlas Announces New Power King Jig Saw

An 18" jig saw with overarm that swings out of the way for cutting large boards is the most recent development of the Atlas Press Company. Designated as the Power-King 18", the new saw's chucks hold all blades and sabers up to 5/16" wide, and files and accessories up to ¼" diameter shank. It requires no adapters or extra chucks. Long stock is cut by inserting the blade in the 90° chuck slot, not by resetting the chucks.

Other features of the Power King are smooth automotive-type drive; splash lubrication; 11" x 11" precision ground table with double-trunnion support; efficient blade guide and work hold down.

For illustrated catalog write the Atlas Press Company, 2557 N. Pitcher St., Kalamazoo, Mich., mentioning SCHOOL SHOP; *or check no. 51 on the coupon.*

New Literature:

McKnight & McKnight has issued its 1953 price catalog with complete listings of all the books available in shopwork, handicraft, etc., along with ordering and discount instructions. Copies may be had by writing to McKnight & McKnight Publishing Company, Bloomington, Ill., mentioning SCHOOL SHOP; *or check no. 52 on the coupon.*

How to Work with Plexiglas is a new publication by Cadillac Plastic Company which features directions and diagrams for cutting and machining, finishing operations, and joining of Plexiglas for a multitude of uses. Write Cadillac Plastic Company, 15111 2nd Ave., Detroit 3, Mich., mentioning SCHOOL SHOP, for a free copy, *or check no. 53 on the coupon.*

A new illustrated catalog in color is being offered free by Whitman & Barnes to shop teachers. It covers their complete line of carbide-tipped and high-speed tool bits. Two tool types are available—red-banded tools for cutting steel and gray-banded tools for cutting cast iron and non-ferrous metals. The catalog describes both types in detail. For more information and copies of the catalog, write Whitman & Barnes, 40600 Plymouth Road, Plymouth, Mich., mentioning SCHOOL SHOP; *or check no. 54 on the coupon.*

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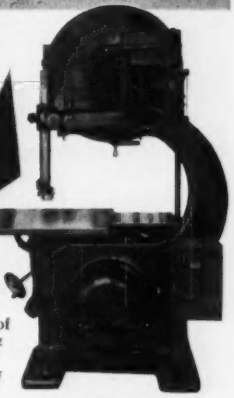

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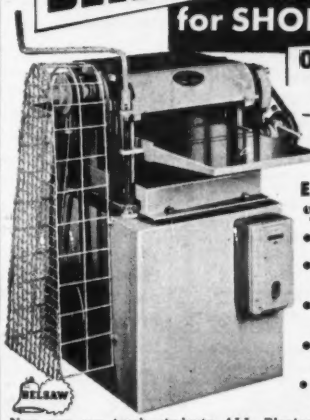

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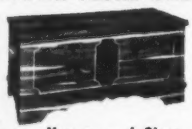

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Washington . . . . . *from page 36*

chapter on the teacher, written by Harry Adner.

Mr. Loomis pointed out that other sections will deal with advisory committees, state teacher trainers, and the state department of education itself.

The uncertainties of government printing are such that this document, Mr. Loomis said sadly, may be out next month, the month after, or the one after that. But when it is out, this reporter will make it "must" reading for himself.

Visit with Amidon.—Miss Edna P. Amidon is chief of the home economics branch in the Vocational Education Division, but what she had to say affects all teachers. It's on that bothersome question of "free teaching aids." Business and industry spend millions of dollars each year preparing booklets, pamphlets, charts, films, and other material. Some are excellent. Some are a waste of the sponsoring-company's money.

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Miss Amidon's group has another word for the makers of the free aids. "Emphasize quality rather than quantity. One excellent pamphlet or film is better than several less effective ones."

Visit with Cooper.—A man going over to a new line of work is likely to reminisce about his former activity. We encouraged this reminiscence and heard from Walter Cooper the story of progress in trade and industrial education, a story stretching back almost three decades.

Today about 800,000 people are in contact with trade and industrial courses. They are served not only by teachers, but by a host of trained and experienced professionals in local, state, and federal positions.

But years ago, Mr. Cooper remembers, there were few who could give expert help to the state or the school systems. The Prossers, the (J. C.) Wrights, the "Skipper" Allens had great influence but they needed the reinforcement of practitioners who could guide trade and industrial courses toward useful channels.

The reinforcement came but with it came great changes and multiplying problems. Instead of one or two score occupations for which people wanted training, the numbers rose to 200 and 300 occupations. Instead of teaching only youth in school, the profession now has to serve adults and youth-out-of-school. And the fast-moving technology is forcing all T & I personnel to keep ever alert and ever preparing for new tasks.

"Years ago, a lather meant a wood worker. Today, he's a metal worker," said Mr. Cooper. "An auto mechanic was required to make his own parts in many instances. Today he is a service specialist, working on body, or brakes, or the transmission. Yesterday's motion-picture projectionist little dreamed that his counterpart today would have to work with electronics."

Mr. Cooper thinks the big problems facing T & I today are these:

1. How to serve better the 600,000 men and women who look to the vocational schools for skills to help them get along better and faster in their employment. "The initial preparation of boys and girls is being handled pretty well by the schools. Their challenge is improving the supplemental training for men and women who are employed," Mr. Cooper said.

2. How to get more and better organized study guides for the less common of the apprenticeable occupations. "We have fairly good supplemental teaching materials for carpentry, auto-mechanics, and so on—but try to find something on stained-glass window glazing or X-ray machine maintenance."

3. How to bring teacher-training help to those instructors who teach part time. In fact, the entire question of teacher education for trade and industrial education is due for a reexamination.

—Mr. Borosage, take it from there.

Ike Salutes Apprentice Program.—The apprentice-training program as administered under the Department of Labor received the support of President Eisenhower in his State of the Union message early in February.

"This department," he said, "was created to serve the entire nation. It must aid, for example, employers and employes alike in improving training programs that develop skilled and competent workers." ★

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The New Administration.—Your reporter visited the federal Vocational Education Division to see what Mrs. Oveta Culp Hobby had to say about education now that she had taken over as head of the Federal Security Agency; what the Committee of Eight, appointed to review America's system of vocational education, had done at its first meeting; what plans were under way to tell Congress about the need for raising appropriations in 1954; and what the new chief of the Trade and Industrial Education Branch thinks about his new job.

It was a premature visit on all counts —yet it turned out to be one of the most rewarding.

Mrs. Hobby's office pleaded it was her first week as Federal Security Administrator and that she had had no time to know what's what in the Office of Education. The Committee of Eight had held only one meeting and was reluctant to say anything. Congress had not yet scheduled hearings on the 1954 appropriations (though the word went around that the subcommittee named to handle vocational appropriations was a "tough one" and stacked heavily against distributive education). And Lawrence Borosage, new T&I head, was still on the way from Ann Arbor to Washington.

The pay-off of this trip to the federal division came during informative and stimulating conversations held with four able and faithful servants in vocational education.

Visit with Strobel.—Assistant Commissioner Joe Strobel gave a few facts about the incoming T & I chief. Larry Borosage is 39 and comes to Washington directly from the University of Michigan, where he has been lecturer and teacher trainer.

Borosage is a native of Wisconsin and started his major industrial experience as a machinist at the Allis-Chalmers Manufacturing Co. He attended Stout Institute and has done his advanced study at Ohio State University. He has written a *Manual of Procedures in Trade and Industrial Education* and *Units of Instruction in Teacher Education.*

"I suppose," said Assistant Commissioner Strobel, "that one of the first tasks Borosage will undertake will be to take inventory of the services the Office ought to provide the states and then see how we can do those jobs for T & I people."

The appointment of Borosage is only one of several "ferments" going on in the federal division. Dr. Stobel indicated that Walter Cooper, who is vacating the T & I headship, will strengthen the employer-employee relationships of the Office of Education by working closer with heads of union, trade and manufacturing associations, and governmental units, such as the Apprentice Service in the Labor Department. Within recent months, Dr. Strobel continued, inquiries from foreign countries about vocational education have increased in number, so that the "international contacts" are assuming "important proportions." Letters—many with technical and involved questions, as well as letters from school executives, teachers and the public generally—are also increasing in number and the division is taking steps to speed up replies. Another "tightening up" is to take place in the area of publications, and last month an internal committee went to work reviewing ideas proposed for bulletins and other documents. As part of its own public relations, the Vocational Division has invited staff members of other Office of Education divisions for briefing and information sessions—a practice that might be duplicated in other places as well.

Visit with Loomis.—Mention of publications brought out the fact that the federal division will soon send to press a document which should be of considerable usefulness to all T & I workers. For a look at the completed manuscript we went to the offices of W. P. Loomis.

It is to be titled *Operation of a Local Program of Trade and Industrial Education.* The emphasis throughout is how to improve instruction. More than 20 practitioners in the field have contributed their ideas and suggestions to this document.

Of more than usual interest will be the chapters dealing with the roles of various officials in improving instruction in a local school system. Thus, there is a chapter on what the superintendent can and should do, by Andrew P. Hill; a chapter on the role of the local director, by Winston D. Purvine; on the principal, by Blanche Marcionette and P. W. Seagren; on the local supervisor, by Frank Huffaker and Lee W. Ralston; on the coordinator, by Eldridge R. Plowden and H. W. Teichroew; and of course, a

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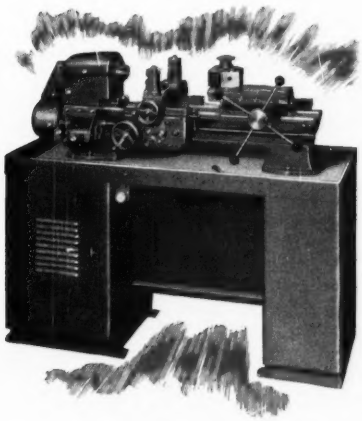

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